# Complete Summary

## GUIDELINE TITLE

Prevention of pertussis, tetanus, and diphtheria among pregnant and postpartum women and their infants. Recommendations of the Advisory Committee on Immunization Practices (ACIP).

## BIBLIOGRAPHIC SOURCE(S)

Murphy TV, Slade BA, Broder KR, Kretsinger K, Tiwari T, Joyce MP, Iskander JK, Brown K, Moran JS, Advisory Committee on Immunization Practices (ACIP) Centers for Disease Control and Prevention. Prevention of pertussis, tetanus, and diphtheria among pregnant and postpartum women and their infants. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep 2008 May 30;57(RR-4):1-51. [437 references] PubMed

## GUIDELINE STATUS

This is the current release of the guideline.

## COMPLETE SUMMARY CONTENT

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## SCOPE

### DISEASE/CONDITION(S)

- Pregnancy
- Pertussis
- Tetanus
- Diphtheria

### GUIDELINE CATEGORY

Management
Prevention
Treatment

## CLINICAL SPECIALTY

Allergy and Immunology
Family Practice
Infectious Diseases
Internal Medicine
Obstetrics and Gynecology
Pediatrics
Pharmacology
Preventive Medicine

## INTENDED USERS

Advanced Practice Nurses
Allied Health Personnel
Health Care Providers
Hospitals
Nurses
Physician Assistants
Physicians
Public Health Departments

## GUIDELINE OBJECTIVE(S)

To provide recommendations on the use of tetanus and reduced diphtheria toxoids (Td) vaccines and acellular pertussis combined with tetanus and reduced diphtheria toxoids (Tdap) vaccines among pregnant and postpartum women for the prevention of pertussis, tetanus and diphtheria among pregnant and postpartum women and their infants

## TARGET POPULATION

Pregnant women and their infants

## INTERVENTIONS AND PRACTICES CONSIDERED

Tetanus and diphtheria toxoids vaccine (Td) and tetanus, reduced diphtheria, and acellular pertussis (Tdap) vaccine

- Routine postpartum vaccination
- Simultaneous administration with other vaccines
- Special situations and considerations for use in pregnant women
    - Deferring administration
    - Tdap in immediate postpartum period
    - Tetanus prophylaxis for wound management
    - The patient with incomplete vaccination
- Reporting adverse events

### MAJOR OUTCOMES CONSIDERED

- Obstetric and neonatal pertussis, tetanus, and diphtheria rates
- Obstetric and neonatal pertussis-, tetanus-, and diphtheria-related hospitalization rates
- Pertussis-, tetanus-, and diphtheria-related adverse events
- Obstetric and neonatal pertussis-, tetanus-, and diphtheria-related related morbidity and mortality rates
- Pregnancy outcomes

## METHODOLOGY

### METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

### NUMBER OF SOURCE DOCUMENTS

Not stated

### METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

### RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

### METHODS USED TO ANALYZE THE EVIDENCE

Review

### DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

### METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

### DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

During June 2006, the Advisory Committee on Immunization Practices (ACIP) evaluated the limited evidence available concerning safety, immunogenicity, and pregnancy outcomes after administration of tetanus, reduced diphtheria, and acellular pertussis (Tdap) vaccine; evidence from historic use of pertussis, tetanus, and diphtheria vaccines in pregnant women; and the potential effects of transplacental maternal antibody on the infant's immune response to active immunization with pediatric diphtheria and tetanus toxoids and whole-cell pertussis (DTP) or diphtheria and tetanus toxoids and acellular pertussis (DTaP) vaccines, or to conjugate vaccines containing tetanus toxoid or diphtheria toxoid. The evaluation included a synthesis of information from scientific literature published in English, unpublished sources of information, consultations, analyses, and extensive discussion by an ACIP working group* during 2005 to 2006. The working group comprised persons with expertise in pertussis, tetanus, and diphtheria; obstetrics and gynecology; pediatrics, family practice, internal medicine, immunology, public health, and vaccine regulation; and liaison members from partner organizations.

The workgroup considered multiple diverse views on the adequacy of evidence needed to form a recommendation for use of Tdap in pregnant and postpartum women. A minority view held that available data from nonpregnant women and men, and experience with the use of diptheria toxoids vaccine (Td) in pregnant women to prevent neonatal and maternal tetanus, were sufficient to support a recommendation for the safe use of Tdap in pregnant women for individual protection from pertussis. The majority view, while acknowledging the desirability of preventing pertussis in pregnant women and the substantial body of information demonstrating the usefulness of Td to prevent maternal and neonatal tetanus, held that the evidence was insufficient at this time to support a recommendation for routine administration of Tdap in pregnant women. The specific issues for pertussis differ from those for tetanus and diphtheria. Important among these is the limited understanding of immunity and correlates of protection for pertussis. In addition, data supporting the safety of vaccinating pregnant women with Tdap to prevent pertussis are scarce for women, their fetuses, and pregnancy outcomes. Whether transplacental maternal antibody exerts an inhibitory or other effect on the infant-protective immune response to active immunization with pediatric DTaP or conjugate vaccines containing tetanus toxoid or diphtheria toxoid has not been studied. Protection against infant pertussis through Tdap-induced transplacental maternal antibody has not been demonstrated. Until additional information is available, the majority view of the working group held that Tdap administered to women in the immediate postpartum period, in addition to ensuring pertussis vaccination of close contacts, would likely provide a measure of protection for mother and infant.

*A list of members appears on inside back cover of the original guideline document.

## RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

## COST ANALYSIS

### Economic Considerations

No study has evaluated the disease morbidity and societal costs associated with pertussis among pregnant women or modeled the cost benefit or cost effectiveness of a tetanus, reduced diphtheria, and acellular pertussis (Tdap) strategy that includes vaccination of pregnant women. The morbidity and societal cost of pertussis in adults is substantial. A retrospective assessment of medical costs of confirmed pertussis in 936 adults in Massachusetts during 1998 to 2000, and a prospective assessment of nonmedical costs in 203 adults during 2001 to 2003 indicated that the mean medical and nonmedical cost per case was $326 and $447, respectively, for a societal cost of $773. If the cost of antimicrobials to treat contacts and the cost of personal time were included, the societal cost could be as high as $1,952 per adult case.

Cost-benefit and cost-effectiveness analyses of adult Tdap vaccination have varied in their results. When discrepancies in the models were addressed, an adult Tdap vaccination program was cost-effective when incidence of pertussis exceeded 120 cases per 100,000 population, using a benchmark of $50,000 per quality-adjusted life year saved.

After adjusting for the severity of the illness at high disease incidence, little effect was observed on the overall cost effectiveness of a vaccination program. Similar results were obtained when program costs and benefits were analyzed over the lifetime of the adult cohort for decennial booster strategies.

### METHOD OF GUIDELINE VALIDATION

Internal Peer Review

### DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

#### Use of Tetanus and Diphtheria Toxoids Vaccine (Td) or Tetanus Toxoid, Reduced Diphtheria Toxoid, and Acellular Pertussis Vaccine (Tdap) in Women Who Have Not Received Tdap Previously

- **Routine postpartum Tdap**. Pregnant women (including women who are breastfeeding) who have not received a dose of Tdap previously should receive Tdap after delivery and before discharge from the hospital or birthing center if 2 years or more have elapsed since the most recent administration of Td; shorter intervals may be used (see "Special Situations," below). If Tdap cannot be administered before discharge, it should be administered as soon as feasible thereafter. The dose of Tdap substitutes for the next decennial dose of Td.
- **Simultaneous administration**. Tdap should be administered with other vaccines that are indicated. Each vaccine should be administered using a separate syringe at a different anatomic site.

**Contraindications to Administration of Td and Tdap**

The following conditions are contraindications to administration of Td and Tdap:

- A history of serious allergic reaction (i.e., anaphylaxis) to any component of the vaccine
- For Tdap (but not Td), a history of encephalopathy (e.g., coma or prolonged seizures) not attributable to an identifiable cause within 7 days of administration of a vaccine with pertussis components

**Precautions and Reasons to Defer Administration of Td or Tdap**

The following conditions are reasons to defer administration of Td or Tdap:

- Guillain-Barré syndrome with onset 6 weeks or less after a previous dose of tetanus toxoid–containing vaccine
- Moderate or severe acute illness
- A history of an Arthus reaction to tetanus toxoid– and/or diphtheria toxoid–containing vaccine less than 10 years previously
- For adults, unstable neurologic conditions (e.g., cerebrovascular events or acute encephalopathic conditions)
- For adolescents, any progressive neurologic disorder, including progressive encephalopathy or uncontrolled epilepsy (until the condition has stabilized)

**Special Situations**

*Deferring Td During Pregnancy to Substitute Tdap in the Immediate Postpartum Period*

Advisory Committee on Immunization Practices (ACIP) recommends administration of Td for booster vaccination during pregnancy if 10 years or more have elapsed since a previous Td booster. To add protection against pertussis, health-care providers may defer the Td vaccination during pregnancy and substitute Tdap as soon as feasible after delivery if the woman is likely to have sufficient tetanus and diphtheria protection until delivery. Sufficient tetanus protection is likely if:

- A pregnant woman aged <31 years has received a complete childhood series of immunization (4 to 5 doses of pediatric pediatric diphtheria and tetanus toxoids and whole-cell pertussis vaccine [DTP], pediatric diphtheria and tetanus toxoids and acellular pertussis vaccine [DTaP], and/or pediatric diphtheria and tetanus toxoids vaccine [DT]) and >1 Td booster dose during adolescence or as an adult (a primary series consisting of 3 doses of Td (or tetanus toxoid vaccine [TT]) administered during adolescence or as an adult substitutes for the childhood series of immunization)*
- A pregnant woman aged >31 years has received a complete childhood series of immunization (4 to 5 doses of pediatric DTP, DTaP, and/or DT) and >2 Td booster doses
- A primary series consisting of 3 doses of Td (or TT) was administered during adolescence or as an adult substitute for the childhood series of immunization,*

- A pregnant woman has a protective level of serum tetanus antitoxin (>0.1 IU/mL by enzyme-linked immunoabsorbant assay [ELISA]).

A woman should receive Td during pregnancy if she

- Does not have sufficient tetanus immunity to protect against maternal and neonatal tetanus, or
- Requires booster protection against diphtheria (e.g., for travel to an area in which diphtheria is endemic**)

Alternatively, health-care providers may choose to administer Tdap instead of Td during pregnancy (see "Considerations for Use of Tdap in Pregnant Women in Special Situations," below).

* Women who have had a 3-dose series as TT instead of Td will likely have protection against tetanus but might not be protected against diphtheria. A protective titer of diphtheria antitoxin is >0.1 IU/mL by ELISA.

**A list of areas in which diphtheria is endemic is available at www.cdc.gov/travel/diseases/dtp.htm.

*Postpartum Tdap When <2 Years Have Elapsed Since the Most Recent Dose of Td*

Health-care providers should obtain a history of adverse reaction after previous doses of vaccines containing tetanus and diphtheria toxoids. Limited information is available concerning the risk for local and systemic reactions after Tdap at intervals of <2 years. Providers may choose to administer Tdap to these women postpartum for protection against pertussis after excluding a history of moderate to severe adverse reactions following previous tetanus and diphtheria-toxoids–containing vaccines.

Health-care providers should encourage vaccination of household and child care provider contacts of infants aged <12 months. Women should be advised of the symptoms of pertussis and the effectiveness of early antimicrobial prophylaxis, if pertussis is suspected.

*Considerations for Use of Tdap in Pregnant Women in Special Situations*

The Advisory Committee on Immunization Practices (ACIP) recommends that Td be administered when booster protection is indicated during pregnancy. Health-care providers may choose to administer Tdap instead of Td during pregnancy to add protection against pertussis in situations when Td cannot be delayed until delivery or when the risk for pertussis is increased. In such cases, the women should be informed of the lack of data on safety, immunogenicity, and pregnancy outcomes for pregnant women who receive Tdap. Whether administration of Tdap to pregnant women results in protection of the infant against pertussis through transplacental maternal antibodies is unknown. Maternal antibodies might interfere with the infant's immune response to infant doses of DTaP or conjugate vaccines containing tetanus toxoid or diphtheria toxoid.

If Tdap is administered, the second or third trimester is preferred unless protection is needed urgently. Providers are encouraged to report Tdap administrations regardless of trimester to the appropriate manufacturers'

pregnancy registry: for ADACEL,® to sanofi pasteur, telephone 800-822-2463 (1-800-VACCINE) and for BOOSTRIX,® to GlaxoSmithKline Biologicals, telephone 1-888-825-5249.

*Tetanus Prophylaxis for Wound Management*

ACIP recommends administration of a Td booster for wound management in pregnant women in certain situations if >5 years have elapsed since the previous Td. Health-care providers may choose to administer Tdap instead of Td during pregnancy to add protection against pertussis in these situations. In such cases, the women should be informed of the lack of data on safety, immunogenicity, and pregnancy outcomes for pregnant women who receive Tdap (see "Considerations for Use of Tdap in Pregnant Women in Special Situations," above).

*Pregnant Women with Unknown or Incomplete Vaccination*

Pregnant women who have not received 3 doses of a vaccine containing tetanus and diphtheria toxoids should complete a series of three vaccinations, including 2 doses of Td during pregnancy, to ensure protection against maternal and neonatal tetanus. The preferred schedule in pregnant women is 2 doses of Td separated by 4 weeks and 1 dose of Tdap administered 6 months after the second dose (postpartum). Health-care providers may choose to substitute a single dose of Tdap for a dose of Td during pregnancy. In such cases, the women should be informed of the lack of data on safety, immunogenicity, and pregnancy outcomes for pregnant women who receive Tdap (see "Considerations for Use of Tdap in Pregnant Women in Special Situations," above).

**Reporting Adverse Events after Vaccination**

All clinically significant adverse events should be reported to the Vaccine Adverse Event Reporting System (VAERS) even if a causal relation to vaccination is uncertain. VAERS reporting forms and information are available at http://www.vaers.hhs.gov or by telephone, 1-800-822-7967. Providers are encouraged to report adverse events electronically at https://secure.vaers.org/VaersDataEntryintro.htm.

### CLINICAL ALGORITHM(S)

None provided

## EVIDENCE SUPPORTING THE RECOMMENDATIONS

### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is not specifically stated for each recommendation.

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

- Improved vaccination coverage levels
- Appropriate use of reduced diphtheria toxoids (Td) vaccines and acellular pertussis combined with tetanus and reduced diphtheria toxoids (Tdap) vaccines among pregnant and postpartum women
- Prevention of pertussis, tetanus and diphtheria among pregnant and postpartum women and their infants
- Decreased burden of pertussis, tetanus and diphtheria and associated complications in pregnant and postpartum women and their infants

## POTENTIAL HARMS

### Safety Considerations for Adult and Adolescent Use of Adult Tetanus and Reduced Diphtheria Toxoids Vaccine (Td) or Adult Tetanus Toxoid, Reduced Diphtheria toxoid, Acellular Pertussis Vaccine (Tdap)

*Interval between Td and Tdap*

The Advisory Committee on Immunization Practices (ACIP) has made several recommendations for intervals between tetanus toxoid– and diphtheria toxoid–containing vaccines that balance the benefits of protection against the risks of moderate and severe local reactions. Moderate and severe local reactions, including Arthus reaction, are associated with frequent dosing at short intervals and larger doses of toxoid. High antitoxin levels are more likely to result when the interval between doses is short and the number of doses increases. High preexisting antibody titers to tetanus or diphtheria toxoids also are associated with increased rates and severity of local reactions to booster doses in adults.

*Important Local Reactions*

Arthus Reaction

Arthus reaction (type III hypersensitivity reaction) can occur after tetanus toxoid– or diphtheria toxoid–containing vaccines. The reaction is characterized by severe pain, swelling, induration, edema, and hemorrhage, and occasionally by local necrosis. Vaccine-related Arthus reaction typically resolves without sequelae.

Extensive Limb Swelling

Extensive limb swelling reactions have been reported to the Vaccine Adverse Event Reporting System (VAERS) following administration of Td and are described following dose 4 or dose 5 of pediatric diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP). Extensive limb swelling after pediatric DTaP resolves without complication within 4 to 7 days, and is not considered a precaution or contraindication for Tdap.

*Neurologic and Systemic Events*

Pertussis Components

The possibility that Tdap would complicate neurologic evaluation of chronic progressive neurologic disorders that are stable in adults (e.g., dementia) is of

limited clinical concern and does not constitute a reason to delay administration of Tdap.

Unstable or evolving neurologic conditions (e.g., cerebrovascular events or acute encephalopathic conditions) would be reason to delay administration of Tdap until the condition has stabilized. Among adolescents who have progressive or uncontrolled underlying neurologic disease, concerns regarding administering Tdap must be weighed against the morbidity from pertussis, which could be severe.

Tetanus Toxoid Component

ACIP considers Guillain-Barré syndrome within 6 weeks after receipt of a tetanus toxoid–containing vaccine to be a precaution (see Precautions and Reasons to Defer Td or Tdap in the original guideline document) for administration of subsequent tetanus toxoid–containing vaccines.

Although the Institute of Medicine (IOM) concluded that evidence favored acceptance of a causal relation between tetanus toxoid–containing vaccines and Guillain-Barré syndrome on the basis of a single well-documented case, subsequent analysis of data from both adult and pediatric populations failed to demonstrate an association. As of January 29, 2007, eight patients with Guillain-Barré syndrome temporally associated with receipt of Tdap or of Tdap administered on the same day with other vaccines had been reported to VAERS. The onsets were not clustered by the interval since vaccination or by a single pattern of vaccine exposure.

ACIP does not consider a history of brachial neuritis to be a precaution or contraindication for administration of tetanus toxoid–containing vaccines. IOM concluded that evidence from case reports and uncontrolled studies involving tetanus toxoid–containing vaccines did favor a causal relation between tetanus toxoid–containing vaccines and brachial neuritis; however, brachial neuritis typically is self-limited. Brachial neuritis is a compensable event through the Vaccine Injury Compensation Program (VICP).

See the "Major Recommendations" field for precautions and reasons to defer Td or Tdap.

## CONTRAINDICATIONS

### CONTRAINDICATIONS

The following conditions are contraindications to administration of adult tetanus and reduced diphtheria toxoids vaccine (Td) or adult tetanus toxoid, reduced diphtheria toxoid, acellular pertussis vaccine (Tdap):

- A history of serious allergic reaction (i.e., anaphylaxis) to any component of the vaccine
- For Tdap (but not Td), a history of encephalopathy (e.g., coma or prolonged seizures) not attributable to an identifiable cause within 7 days of administration of a vaccine with pertussis components

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

- This report includes discussions of the use of adult tetanus and reduced diphtheria toxoids vaccine (Td) or adult tetanus toxoid, reduced diphtheria toxoid, acellular pertussis vaccine (Tdap) in the following situations in which Td or Tdap is not indicated according to current U.S. Food and Drug Administration (FDA) labeling:
    A. When the interval between Td and Tdap might be <5 years as specified in the package inserts
    B. When progressive or unstable neurological disorders (e.g., cerebrovascular events, acute encephalopathic conditions) exist that are considered precautions and a reason to defer Td and/or Tdap
    C. When Tdap is used as part of the primary series for tetanus and diphtheria
    D. When Tdap or pediatric DTaP is administered inadvertently outside the licensed age indications

- Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Department of Health and Human Services.
- References to non-Centers for Disease Control and Prevention (CDC) sites on the Internet are provided as a service to *MMWR* readers and do not constitute or imply endorsement of these organizations or their programs by CDC or the U.S. Department of Health and Human Services. CDC is not responsible for the content of these sites. URL addresses listed in *MMWR* were current as of the date of publication.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

#### Implementing Adult Tetanus Toxoid, Reduced Diphtheria Toxoid, Acellular Pertussis Vaccine (Tdap)

*Preconception Assessments*

Administering a dose of Tdap during routine wellness visits of adult and adolescent women of childbearing age, if indicated, is the most effective programmatic strategy to ensure that women are protected against pertussis in addition to tetanus and diphtheria and minimizes any theoretical effect of vaccination on infant immune responses should the woman become pregnant (see "Immunity to Pertussis and Kinetics of Pertussis Booster Vaccination in Nonpregnant Adults and Adolescents" in the original guideline document). Because Tdap contains only toxoids and purified bacterial components, women who receive Tdap do not need to wait after vaccination to become pregnant. Assessments provide repeated opportunities for documenting the history of past doses of adult tetanus and reduced diphtheria toxoids vaccine (Td) (or tetanus toxoid vaccine [TT]) and any serious adverse reactions to tetanus, diphtheria, and pertussis vaccines. To access and maintain immunization records, state-based

immunization information systems (IIS) are increasingly becoming available to clinicians and public health officials. These confidential, computerized information systems, which consolidate vaccination data from multiple healthcare providers, can generate reminder and recall notifications, assist with vaccine management and adverse events reporting, and capture lifespan vaccination histories. Additional guidance regarding administration of vaccines during routine assessments, record keeping, vaccine storage, and related topics has been published previously.

*Prenatal Visits: Deferring Td During Pregnancy to Substitute Tdap in the Immediate Postpartum Period*

In 2004, a total of 96% of pregnant women started prenatal care in the first or second trimester. Prenatal visits provide additional opportunities for assessing the history of past vaccination with Tdap, Td, or TT and any serious adverse reactions to tetanus, diphtheria, and pertussis vaccines.

Women who have not received a previous dose of Tdap can be advised that the Advisory Committee On Immunization Practices (ACIP) recommends Tdap postpartum before discharge from the hospital or birthing center to provide personal protection and reduce the risk for transmitting pertussis to their infants.

Health-care providers can monitor pregnant women for respiratory illness consistent with pertussis or for recent exposure to pertussis, either to themselves or to family members, and prescribe a macrolide antimicrobial for treatment of pertussis or postexposure prophylaxis, if indicated. Women and their partners should receive counseling regarding the severity of infant pertussis and ACIP's recommendation for a single dose of Tdap for adults and adolescents who anticipate contact with an infant. In a 2005 national survey of obstetricians, 72% of respondents affirmed the belief that obstetricians, pediatricians, adult primary care providers, and public health providers share responsibility to promote administration of Tdap for adults who anticipate contact with an infant, including fathers and close relatives. Ideally, health-care providers delivering prenatal care will encourage persons likely to have contact with an infant, including child care providers, to receive Tdap first.

When pregnant women who have not received Tdap have indications for tetanus or diphtheria booster protection (>10 years since the most recent Td), ACIP recommends receipt of Td during pregnancy (see Table 2 in the original guideline document). ACIP has developed criteria for safely deferring administration of Td until delivery among women who have received past tetanus toxoid– containing vaccinations, so the majority of these women can substitute Tdap in the immediate postpartum period for Td during pregnancy (see "Deferring Td During Pregnancy to Substitute Tdap in the Immediate Postpartum Period" in the original guideline document). When the history of tetanus toxoid vaccination for the women is uncertain or lacking, health-care providers can determine the concentration of tetanus antitoxin to ensure protective concentrations of tetanus antitoxin (>0.1 IU/mL by enzyme-linked immunoabsorbant assay [ELISA]). Because diphtheria is rare in the United States, serologic screening for diphtheria antitoxin typically is not necessary. A woman who anticipates travel to an area in which diphtheria is endemic can improve protection against diphtheria by

receiving a booster dose of Td during pregnancy or a dose of Tdap postpartum. Serologic screening to establish immunity to pertussis is not useful.

In special situations in which a pregnant woman has increased risk for tetanus, diphtheria, or pertussis, ACIP acknowledges that health-care providers may choose to administer Tdap instead of Td during pregnancy to add protection against pertussis, after discussing the theoretical benefits and risks for her, her fetus, and the pregnancy outcome with the woman before vaccination (see "Considerations for Use of Tdap in Pregnant Women in Special Situations" in the original guideline document). Data to inform this decision are scarce. No theoretical risk for harm to the mother or fetus exists from Tdap, and administration of Tdap in the pregnant woman might provide a degree of early protection to the infant against pertussis. However, a theoretical risk for the infant is that the dose of Tdap in pregnancy might not result in early protection against pertussis or could increase transplacental pertussis-specific antibodies to levels that would have a negative effect on the infant's response to immunization with pediatric DTaP or with conjugate vaccines containing tetanus toxoid or diphtheria toxoid (e.g., *Haemophilus influenzae* type b pneumococcal conjugate vaccine). Health-care providers who choose to vaccinate pregnant women with Tdap are encouraged to report such administration to the manufacturers' pregnancy registry.

**Postpartum Tdap**

In 2004, a reported 99% of live births in the United States occurred in a hospital. Of out-of-hospital live births, 27% occurred at a free-standing birthing center and 65% at a residence. In these settings, attendants can implement protocols to ensure that postpartum women who have not received Tdap previously receive it before discharge. They also can encourage previously unvaccinated adults and adolescents who anticipate contact with an infant to receive Tdap. Tdap vaccination of the women and potential contacts before discharge rather than at a follow-up visit has the advantage of decreasing the time when new mothers and contacts of the newborns could acquire and transmit pertussis to the infants. Standing orders for postpartum Tdap vaccination before discharge have successfully raised vaccination rates to more than 80% of eligible women. Although obtaining a history of the most recent Td vaccination was anticipated to be a barrier to postpartum vaccination with Tdap, in practice it was not identified as a barrier.

Vaccination of parents and household contacts of premature infants has been advocated to ensure that such persons receive Tdap. Premature and low birth weight infants are at increased risk for severe and complicated pertussis. The case-fatality rate for pertussis is increased compared with term infants, and premature infants might respond less well than term infants to initial doses of DTaP vaccine because of comorbidities or treatments (e.g., dexamethasone).

Parents should be reminded of other measures to protect infants from pertussis. To the extent feasible, parents can limit infant exposures to persons who have respiratory illness until they are determined to be noninfectious. When pertussis exposure occurs, antimicrobial prophylaxis of exposed contacts can be effective in preventing transmission of pertussis. Ensuring that infants begin the pediatric DTaP vaccination series at the recommended chronologic age of 6 to 8 weeks is

critical to protection and reducing the severity of pertussis. Administration of 2 or 3 doses of pediatric DTP or DTaP can prevent hospitalization for pertussis and its complications.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Staying Healthy

### IOM DOMAIN

Effectiveness
Patient-centeredness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

Murphy TV, Slade BA, Broder KR, Kretsinger K, Tiwari T, Joyce MP, Iskander JK, Brown K, Moran JS, Advisory Committee on Immunization Practices (ACIP) Centers for Disease Control and Prevention. Prevention of pertussis, tetanus, and diphtheria among pregnant and postpartum women and their infants. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep 2008 May 30;57(RR-4):1-51. [437 references] PubMed

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

2008 May 30

### GUIDELINE DEVELOPER(S)

Centers for Disease Control and Prevention - Federal Government Agency [U.S.]

### SOURCE(S) OF FUNDING

United States Government

### GUIDELINE COMMITTEE

Advisory Committee on Immunization Practices Pertussis Working Group

Advisory Committee on Immunization Practices

## COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

### Advisory Committee on Immunization Practices Pertussis Working Group, Membership List, June 2006

*Chairman*: Dale Morse, MD, Albany, New York

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### Advisory Committee on Immunization Practices Membership List, June 24, 2006

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